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FOREST INSECT INVESTIGATIONS

ENGELMANN SPRUCE BEETLE INFESTATION YELLOWSTONE NATIONAL PARK - 1937

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Introduction

An infestation of the Engelmann spruce beetle, Dendroctonus engelmanni, has been present within the spruce stands of the northwest corner of Yellowstone National Park for the past four or five years. Observations indicate that this outbreak started in 1933 on the Gallatin slope, or west side of the mountain range which extends north and south through this section of the park. During subsequent years the outbreak spread eastward across the mountains, until at this time the head of the infestation apparently lies within the Winter Creek drainage.

The loss of timber as a result of this epidemic has been very severe. Though for the most part the attacks of the beetles have been confined to trees of 10 or 12 inches or more in diameter, a few smaller trees have been killed. Within the areas on the Gallatin side of the mountains approximately 90 percent of the trees above 10 inches in diameter have been killed, with a few scattered trees now harboring 1937 attacks. On the east, or Gardiner River, side of these mountains the loss, which includes the 1937 attacks within the rather large area

Mr. T. T. Terrell, Forest Insect Laboratory, Coeur d'Alene, Idaho, accompanied by Park Forester Walker, made an extensive examination of the infestation throughout the northwest corner of the park. Mr. A. L. Gibson, Forest Insect Laboratory, Coeur d'Alene, Idaho, made an intensive examination of the infestation within the Straight and Winter Creek drainages.

of spruce extending from Mount Holmes to Quadrant Mountain and within the scattered areas of spruce around Little Quadrant Mountain, is extremely severe and will comprise at least 50 percent or more of the larger trees. In the Winter Creek drainage the loss is not as heavy, for the 1937 infestation, which increased materially over that of 1936, marks the first year of severe damage. In this area approximately 25 percent of the mature trees have been killed.

Most of the spruce areas are not visible from the park highways and will be seen by only a very few park visitors. Furthermore, all of the areas are well stocked with a dense stand of spruce and fir reproduction of mixed ages, which provides well for the future stocking. Though the destruction of the mature trees has created a serious fire hazard which will last for many years, the forest cover has not been seriously affected. However, the Winter Creek or Apollinaris Spring area is adjacent to the main loop highway and includes the scenically attractive spruce stand around the Apollinaris Spring. The destruction of the spruce trees around this very popular utility area would of course seriously mar its beauty.

1937 Situation

An aggressive epidemic of the Engelmann spruce beetle which during the past few years has spread throughout the spruce stands of the northwest portion of the park continued its destructiveness in 1937.

The head of this infestation now lies within the last bit of spruce type in this portion of the park, which unfortunately is the area for which protection is especially desired. The institution of control throughout all spruce areas could hardly be justified, for with the exception of the small Apollinaris Spring area there are practically no timber stands left to protect. Though no survey has been made of all these east-side areas, it can be conservatively estimated that there are at least 10,000 trees containing 1937 attacks, and it is entirely possible that there are more than twice this many. As a result, the treatment of this large block of infested trees would have as its only justification the protection of the relatively small area immediately surrounding Apollinaris Spring. However, with the desire to protect these trees, the possibility of treating only the so-called Apollinaris Spring area was considered, and to secure the desired data concerning the 1937 status of the infestation an intensive survey was conducted.

Status of Infestation Within the Apollinaris Spring Area

Within this area which totals perhaps some seven or eight hundred acres, approximately 20.5 miles of sample strip one chain in width were run. On this strip 467 infested trees were located, which averaged 2.85 trees per acre. This gives a total of 1,988 trees harboring 1937 attacks of the Engelmann spruce beetle. Data was also

secured relative to the residual stand, which shows that on the area there still remain 9,962 Engelmann spruce trees above 8 inches in diameter. This area includes the rather narrow strip of spruce type along the west side of Willow Park, as well as the Winter Creek drainage. The infestation extends up Winter Creek approximately one mile above the Straight Creek fork, and up Straight Creek to the head of Grizzly Lake, and possibly the spruce type above the lake. There is also some infestation within the strip of spruce along the east side of the highway from Apollinaris Spring southward to Obsidian Cliff. The acreage shown for this area may be somewhat in error, as the exact boundaries of the spruce type was not determined. Though the total number of estimated acreage is believed to be fairly close to the actual figure, any marked departure will affect the total number of infested trees recorded for the area.

Recommendations

A recommendation for the institution of control within the Apollinaris Spring area would be based upon a very unstable entomological foundation. Though the area is isolated from other spruce stands, the degree of isolation is not very pronounced, for that portion of the area on Winter Creek is only a few miles distant from the Mount Holmes infestation. Furthermore, the history of this infestation has

clearly demonstrated its ability to spread from one bit of spruce type to another, so the degree of isolation which exists can not be considered as a barrier to the movement of the insects. The institution of control within the Apollinaris Spring area would only eliminate the subsequent danger from the existing infestation and would give no assurance that there would be no reinfestation from the heavy source of beetle population within the Mount Holmes unit. The extent of any 1938 reinfestation of the Apollinaris Spring area from nearby untreated units can not be foreseen. One may be relatively sure that in these adjacent sources of beetle population the infestation must practically cease in 1938 due to the shortage of host material. In brief, the success of such a project would seem to rest upon the character of the reinfestation which one may be assured will occur in 1938. If such reinfestation from the untreated areas is relatively light, it is possible that the associated damage could be absorbed in the residual stand without any serious scenic losses, though of course maintenance or follow-up control would be necessary. On the other hand, should the entire force of these heavy centers of infestation be directed into the Apollinaris Spring area, the results obtained by treating the 1937 infestation would be lost.

Though the treatment of all the infestation on the east side of the mountains is the only sound entomological approach to this problem, the treatment of the Apollinaris Spring area is an alternative which offers a good chance for success. It should be understood that the

institution of control within this small portion of the total infestation unit can only be considered as taking the last chance of preserving the scenic spruce stands which still remain, and for which no guarantee of success can be given.

No attempt has been made to estimate the cost of control within the Apollinaris area, as it is understood that no funds are available, and that the work if instituted will need be conducted by CCC enrollees. Most of the area can be worked from the highways, though the Straight Creek infestation, which extends to and perhaps above Grizzly Lake, and which is the most heavily infested portion of the area, would seem to require the establishment of a small spike camp.

In summarizing it is again stated that the only sound entomological approach to the solution of this problem would be to treat all of the infested trees on the east side, or Gallatin River drainage, of the mountains. The institution of such a project would stop the continued spread of the infestation and preserve a very large percentage of the residual spruce stands still remaining. The degree of success associated with this project would be in direct proportion to the thoroughness of the treatment. The institution of control within the Apollinaris Spring area alone must be considered as an unsound alternative, but one which offers a fair chance of preserving the trees for which protection is desired. It is believed that in consideration of the values at stake this chance may be sufficient to warrant the necessary expenditures.

However, this decision must rest with the agency charged with the protection of the timber stands at stake.

Respectfully submitted,

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Coeur d'Alene, Idaho
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